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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/752,955

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Gopal Ramachandran

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05/25/2006

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EXAMINER

SEVER, ANDREW T

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 05/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/752,955

Applicant(s)

RAMACHANDRAN ET AL.

Examiner

Andrew T. Sever

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-21 and 23-42 is/are pending in the application.
- 4a) Of the above claim(s) 13-15 and 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,16-21,23-30 and 34-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 13-15 and 31-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/25/2005.

### ***Drawings***

2. The drawings were received on 10/27/2005. These drawings are acceptable.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3, 6-12, 16, 17, 21, 23, 26-30, 34, 35, and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller et al. (US 6,233,024 as cited in the previous office action) in view of Tejima et al. (US 5,274,406)

Hiller teaches in figure 4 an off-axis projection system for displaying an optical image on a display surface based on input image data, comprising:

(a) An image-processing unit for receiving the input image data and generating distortion-compensated image data (see column 2 lines 56-67);

(b) A projection light engine (1) coupled to the image processing unit for receiving the distortion-compensated image data and projecting a distortion-compensated optical image that corresponds to the distortion-compensated image data; and,

(c) An optical reflection assembly (3 also see figure 6 which teaches more than one mirror) coupled to the projection light engine, said optical reflection assembly comprising at least one curved mirror (3 is curved in figure 4), said curved mirror being positioned in the optical path of the distortion-compensated optical image emerging from a projection lens for producing a displayed optical image with reduced distortion on the display surface;

Wherein, said image processing unit is adapted to distortion-compensate the optical image represented by the input image data such that when said distortion-compensated optical image is projected through the projection light engine and reflected off the optical reflection assembly, the optical and geometric distortions associated with said projection light engine and the optical reflection assembly are substantially eliminated in the displayed optical image (again see column 2 lines 56-67.)

Hiller, however, does not teach that the at least one curved mirrors is an aspherical rotationally non-symmetric mirror having a vertically oriented concave surface and a horizontally oriented surface with a varying degree of concave or convex curvature on an upper surface that smoothly transitions to a varying degree of convex curvature on a lower surface for reducing spatial distortion on the displayed optical image. Tajima teaches in figure 13c a projector similar to that of Hiller. Figure 14a of Tajima shows a mirrored surface that is curved in the claimed manner. Tajima teaches in column 4 lines

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35-59 that rear projection displays such as Hiller can be made thinner if the distortion caused by the inclination of the optical axis of the projection lens is compensated for. The curved mirror taught by Tajima in figure 13c compensates for the distortions caused by the inclination. Accordingly since it is desirable to make the display as thin as possible while eliminating distortions; it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a curved mirror as taught by Tajima in the projection system of Hiller.

*With regards to applicant's claim 3:*

See figures 13F and elsewhere of Tajima.

*With regards to applicant's claim 6:*

This is what image processors primarily do (taking the image data and putting it in a form usable by the projection light engine.)

*With regards to applicant's claim 7:*

Hiller includes a light generator (1), a display device (the projection lens or round part of the box forming the light generator, and projection optics

*With regards to applicant's claim 8:*

Clearly the lens of Tajima is offset from the display axis.

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*With regards to applicant's claims 9 and 10:*

Hiller is off-axis for purposes of improving MTF.

*With regards to applicant's claim 11:*

The projector of Hiller includes a light generator (r-g-b laser(s)), a micro display (a deflector) and as can clearly be seen such as in figure 9c of Tajima lens elements. (See column 3 of Hiller for the specific parts.)

*With regards to applicant's claim 12:*

See column 2 lines 56-67 of Hiller, which teaches that the micro-display device is caused to display an image that it is compensated for keystone and other spatial distortions.

*With regards to applicant's claim 16:*

Clearly both Hiller and Tejima are rear projection type projection systems.

*With regards to applicant's claim 17:*

See figure 15A of Tejima wherein the curved mirror of Tejima (figure 14 a) is replaced with a Fresnel type mirror.

*With regards to applicant's claims 21, 23, 26-30, 34, and 35:*

See above wherein the method of using the projection system of Hiller in view of Tajima is obvious. (MPEP 2112.02).

*With regards to applicant's claims 39-42:*

See above wherein the at least one mirror of Hiller in view of Tajima meets the claimed curved mirror.

6. Claims 4, 5, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller in view of Tajima as applied to claim 1, 3, 6-12, 16, 17, 21, 23, 26-30, 34, 35, and 39-42 above, and further in view of Suzuki et al. (US 2004/0046944 as cited in the previous office action.)

As described in more detail above Hiller in view of Tajima teaches a projection system and associated method, which among other things includes a curved mirror.

Hiller, however, does not teach a lens that is an aspherical rotationally non-symmetric lens positioned prior to the curved mirror. Suzuki teaches in figure 1 a projection optical system including a mirror (16) and a lens (15). Suzuki teaches in paragraphs 22-26 that the lens is an aspherical lens, which is designed to cancel the curvature of field of the reflecting part. Accordingly since it is desirable to eliminate such aberrations it would have been obvious to include the lens of Suzuki in the projector of Hiller in view of Tajima.

*With regards to applicant's claims 24 and 25:*

See above wherein the method of using the projection system above is obvious (See MPEP 2112.02).



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7. Claims 18-20 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller in view of Tajima as applied to claims 1, 3, 6-11, 12, 16, 17, 21, 23, 26-30, 34, 35, and 39-42 above, and further in view of Nishizawa (US 2004/0032982 as cited in the previous office action.)

As described in more detail above Hiller teaches a projection system which among other things includes an image processing unit. Hiller does not specifically teach what the image-processing unit comprises of. Nishizawa teaches in paragraphs 12-14 that it is beneficial for the image processing unit to include a luminance correction state which individually processes different spectral pass bands as claimed in applicant's claim 19, 20, 37, and 38. Nishizawa states that by making these corrections the unnatural image displayed by the prior art can be corrected for. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the luminance correction of Nishizawa in the image-processing unit of Hiller.

### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1, 3, 4-12, 16-21, 23-30, and 34-42 have been considered but are moot in view of the new ground(s) of rejection.

The Sunaga reference has been replaced with the Tajima reference.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AS



**William Perkey**  
**Primary Examiner**